REMARKS/ARGUMENTS

Claims 16, 18-20, 25, 34, 35 and 39-42 are pending in the application. New claims 43-50 are added herein.

Support for new claims 43-50, which are directed to polypeptides and polypeptide vaccines containing a specified portion of SEQ ID NO. 2 is found in Table 3. Tables 1, 4, 6, 7, 8, and 9 contain data showing the immunoprotective activity of the claimed amino acid sequences. Accordingly, no new material is added by these amendments to the claims.

I. Claim Objections

It is respectfully submitted that the amendment to claim 25 renders the objection to this claim moot. It is also respectfully submitted that the different scope of language in claims 19, 20 and 35 is correct. The specific amino acid sequence being claimed **consists of the listed amino acids** (*e.g.*, SEQ ID NO. 2), but the polypeptide containing the specified amino acid sequence may also be modified, in which case it has the specified amino acid sequence and may contain other elements, *e.g.*, polysaccharide, PEG, etc. as disclosed at page 25. Thus, the open language is appropriate to define the other elements of the polypeptide, and the closed language properly defines the claimed amino acid sequence.

II. Claim rejections Under 35 U.S.C. § 112

It is respectfully submitted that the amendment to claim 25 renders the rejection to this claim under 35 U.S.C. § 112 moot. It is also respectfully submitted that the explanation above addresses the rejection of claims 19, 20 and 35. Accordingly, the rejection of the claims under 35 U.S.C. § 112 is respectfully traversed.

III. Rejection of Claims 16, 19-20, 25, 34, 35, and 40-42 Under 35 U.S.C. § 102(e)

Claims 16, 19, 20, 25, 34, 35, and 40-42 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Johnson *et al.* (US 6,582,706) as evidenced by Hermand et al. (US 2004/0081662). The Examiner states that Johnson *et al.* discloses a polypeptide that shares 95% sequence identity with an amino acid sequence of SEQ ID NO. 2 (amino acids 1-1039) and would elicit a protective antistreptococcal immune response. The Examiner concludes, therefore, that the cited reference anticipates the claimed invention.

Applicant respectfully disagrees with the Examiner.

Contrary to the Examiner's assertion, the cited reference does not teach a polypeptide that shares 95% sequence identity with SEQ ID NO. 2 (amino acids 1-1039) and elicits a protective immune response when administered *in vivo*. Johnson merely discloses the isolation and sequence of the amino terminal end of phtE (amino acids 1-484). Thus, this reference merely discloses the amino terminal end of SEQ ID NO. 2.

Moreover, Johnson does not provide any evidence that the disclosed polypeptide provides any protective immunity when administered *in vivo*. The Examiner has not cited a single disclosure in the '706 patent that demonstrates protective immunity and indeed, cannot, because

Applicant's own studies clearly demonstrate that the amino terminal portion of SEQ ID NO. 2 (amino acids 1-509) does not provide protective immunity *in vivo* from challenge with *S. pneumonia*.

The present specification demonstrates unequivocably that the amino terminal portion of SEQ ID NO. 2 (which corresponds to Johnson's polypeptide-- amino acids 1-484 of pthE) provides no protection to mice challenged with *S. pneumonia*. Table 3 of the specification (p. 53) provides a list of various fragments of SEQ ID NO. 2 that were generated by Applicant and tested as vaccine candidates. Among the fragments tested is BVH-3M (amino acids 21-1039 of SEQ ID NO. 2); BVH-3AD (amino acids 21-509); BVH-3B (amino acids 512-1039); BVH-3C (amino acids 21-225); New 1 (amino acids 472-1039); New 3 (amino acids 800-1039); and New 15 (amino acids 21-800).

When used in protection studies *in vivo*, only those fragments containing amino acid sequence **downstream** of amino acid sequence 1-484 showed any protection *in vivo*. For example, Table 6 (page 60) shows that mice vaccinated with BVH-3M (amino acids 21-1039, which corresponds to SEQ ID NO. 2 without the 21 amino acid secretory sequence) shows that all challenged mice were protected for more than 14 days. This study demonstrates that the secretory sequence(amino acids 1-21) is not necessary for protection and that the mature polypeptide provides a protective antistreptococcal response.

Table 8 (page 64) provides evidence that the amino terminal end of SEQ ID NO. 2 (*e.g.*, Johnson's polypeptide) does not provide any protection *in vivo*. All of the mice vaccinated with BVH-3AD (amino acids 21-509) or BVH-3C (amino acids 21-225) died within two days of challenge with *S. pneumonia*, whereas five of eight mice vaccinated with a polypeptide comprising amino acids 512-1039 of SEQ ID NO. 2 survived challenge for 14 days or longer. This study clearly refutes the Examiner's assertion that Johnson's polypeptide (amino acids 1-484) "would elicit a protective antistreptococcal immune response."

Thus, applicant's data demonstrating a lack of a protective immunity and Johnson's failure to demonstrate any protective immunity using a polypeptide consisting of amino acids 1-484 render the Examiner's assertion of anticipation moot.

It is also noted that the Examiner provided a Swiss-Prot Blast search alignment showing alignment of the claimed polypeptide (SEQ ID NO. 2) with the complete amino acid sequence of phtE. The purpose of the Examiner's alignment analysis is not understood, since the complete sequence of phtE was not publicly available until 2000, after the filing date of the present application. That there is any sequence similarity of BVH3 to a later discovered polypeptide has no bearing on the patentability of the present claims.

Further, the Examiner asserts that US 2004/0081662 provides evidence of anticipation by Johnson *et al.*, but does not provide any reasons or point to any evidence. This reference does not provide any evidence of immuno protection resulting from administration of a polypeptide consisting of amino acids 1-484 of phtE (Johnson's polypeptide) and therefore, does not support the Examiner's assertion of anticipation.

Accordingly, the rejection of the claims under 35 U.S.C. § 102(e) over Johnson *et al.* as evidenced by Hermand et al is respectfully traversed.

IV. Rejection of Claims 16, 19-20, 25, 34, 35, and 40-42 Under 35 U.S.C. § 102(a)

Claims 16, 19, 20, 25, 34, 35, and 40-42 stand rejected under 35 U.S.C. § 102(a) as being anticipated by WO 98/18930 (WO98) as evidenced by US 2004/0081662. The Examiner states that WO98 discloses a polypeptide that shares 95% sequence identity with an amino acid sequence of SEQ ID NO. 2 and would elicit a protective antistreptococcal immune response. The Examiner concludes, therefore, that the cited reference anticipates the claimed invention.

As discussed in the Preliminary Amendment filed November 15, 2003, WO98 does not anticipate the claimed invention because this reference merely discloses SEQ ID NO. 182 (amino acids 1-447), a fragment of BVH-3 that falls within then-terminal region of the polypeptide **shown by Applicant** to lack immunity inducing capability. *See*, Dr. Hamel's Declaration (of record). WO98 discloses fragments of *S. pneumonia* proteins, but does not provide any evidence of immunoprotection obtained with the disclosed peptide fragment, and as discussed above, Applicant's own studies clearly show that the prior art fragment does not elicit a protective immune response.

The Examiner's reliance on US 2004/0081662 as evidencing immunoprotection is misplaced. This reference does not provide any evidence that the amino terminal portion (amino acids 1-484) of BVH-3 provides immunoprotection to vaccinated animals. There is nothing in this reference or WO98 that refutes the evidence provided in the present specification, *i.e.*, the amino terminal portion of the BVH-3 polypeptide is not immunoprotective. As such, the claimed invention is not anticipated by WO98.

Accordingly, the rejection of claims 16, 19-20, 25, 34, 35, and 40-42 under 35 U.S.C. § 102(a) as being anticipated by WO98 is respectfully traversed.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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